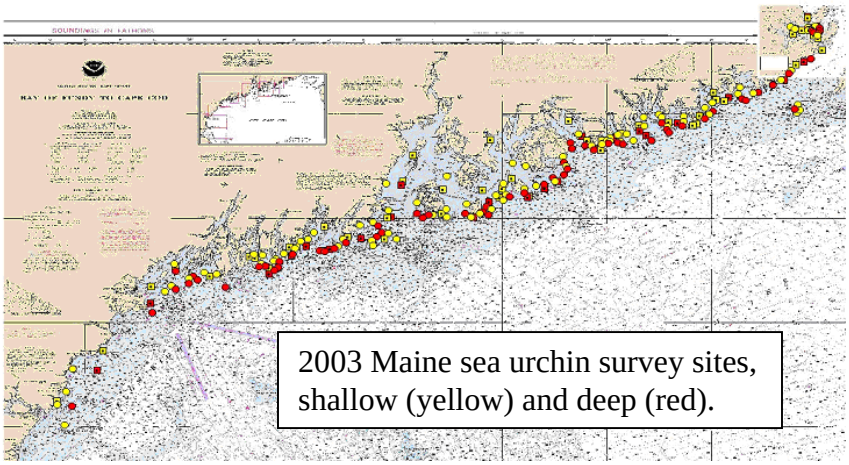
Maine's Sea Urchin Survey

In 2001, DMR, with the cooperation of industry, the SUZC, and scientists and students at the University of Maine, began an annual spring sea urchin dive survey, funded by the industry. It is probably the most thorough urchin survey in the world. DMR and industry divers counted and measured urchins at 135 shallow sites, working from industry vessels. A remotely deployed video camera was used to view the bottom at 90 deeper sites. Crabs, starfish, and algal (seaweed) cover were evaluated. The survey has been repeated each year since 2001. 72 of the sites visited in 2001 were recommended by harvesters to be revisited each year. The rest are picked randomly from suitable bottom types and depths. At least half of the fieldwork and urchin census-taking is conducted by (an) industry diver(s), working side-by-side with a highly experienced DMR diver, from industry vessels. About $30,000 is returned to the industry from the urchin research license surcharge fund to pay urchin divers, vessels, and crew for the 9 weeks of the survey each year.

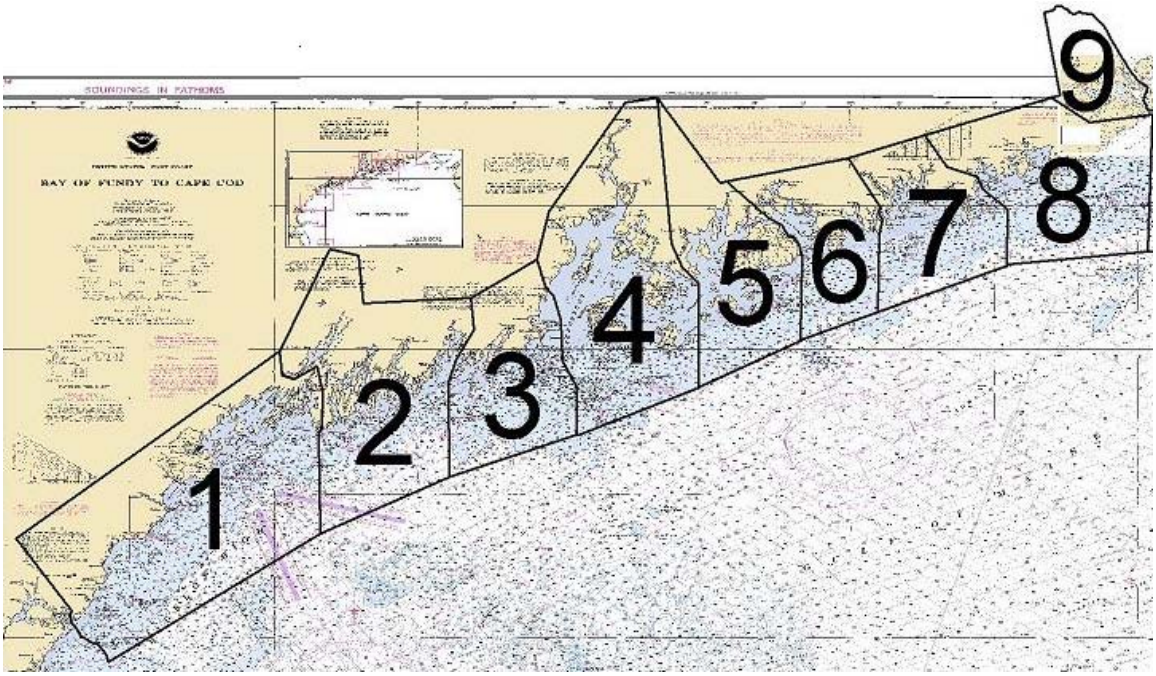


2003 Maine sea urchin survey sites, shallow (yellow) and deep (red).

The state's coast was divided into nine regions, and 15 shallow sites and 10 deeper sites are visited in each region each year. 60 quadrats are evaluated at each dive site. In the three surveys so far, 31,375 one-meter-square quadrats have been evaluated, 260,332 urchins of all sizes have been counted, and 33,504 have been measured.

Results are presented in the graphs on the next page. They show declines in the total urchin stock biomass in 7 out of 9 regions since 2001. Declines of particular concern are in regions 2 (Phippsburg-Boothbay-Bremen), 4 (Islesboro-Vinalhaven-Stonington), 7 (Milbridge-Addison-Jonesport), and 8 (Roque Is-Machiasport-Cutler). There has also been an increase in algal cover statewide from 79% in 2001 to 87% in 2003. (Note that algal cover is the sum of turfing and canopy covers in depths less than 50ft, and can be greater than 100%.)

To be sure the declines are real, and not due to natural variance in the selection of random sites, it is useful to look at the results for the harvester-recommended fixed sites. Of the 49 fixed sites that had urchins in 2001, a large majority - 37 sites (76%) - had fewer urchins by 2003.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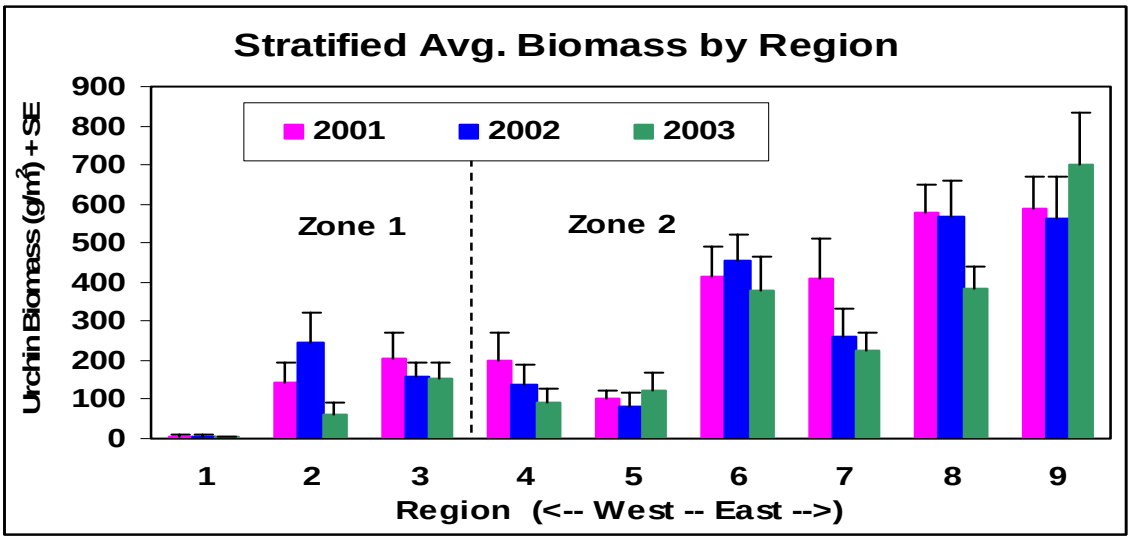
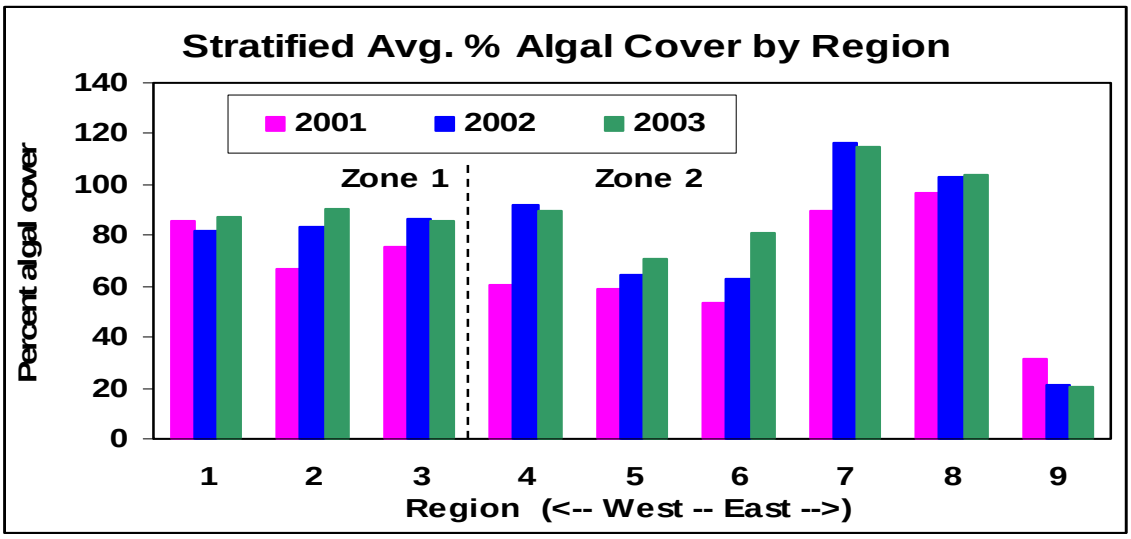

Stratified Avg. Biomass by Region
Urchin Biomass (g/m²) + SE
2001
2002
2003
Zone 1
Zone 2
0
100
200
300
400
500
600
700
800
900
1
2
3
4
5
6
7
8
9
Region (<-- West -- East -->)


Stratified Avg. % Algal Cover by Region
Percent algal cover
2001
2002
2003
Zone 1
Zone 2
0
20
40
60
80
100
120
140
1
2
3
4
5
6
7
8
9
Region (<-- West -- East -->)